Rebuilding Your VDO Speedometer

By Jeff Caplan

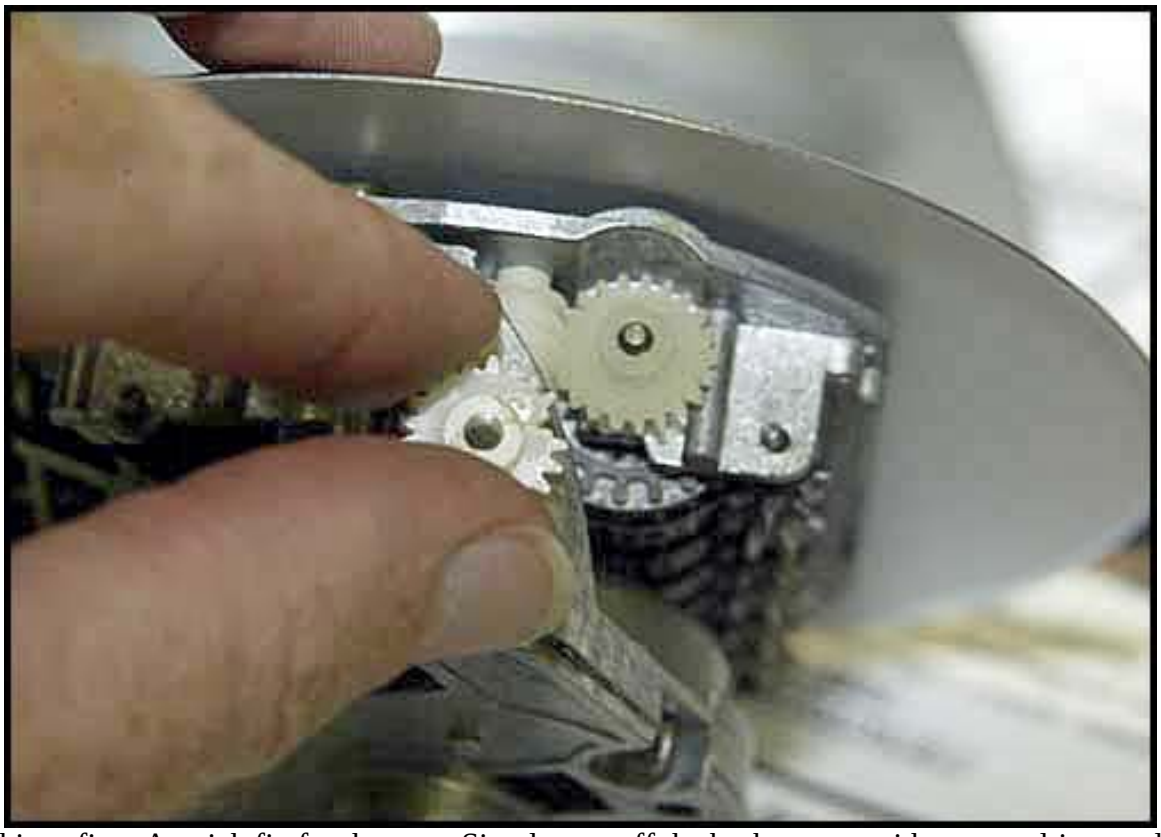
Disclaimer:

I am not in anyway advocating anyone to alter their odometer. If you do anything, make sure that you follow federal laws and report any changes to your local DMV. In this FAQ, I will show you how to take apart your speedometer to lubricate it and fix internal gears. I can't promise that you won't break the needle taking it off or that it will be calibrated when you are done. This is for taking a broken speedometer and hopefully fixing it while understanding how it works. Also, it's a great opportunity to take a gadget apart and put it back together (It's a guy thing).

The speedometer you will see in the photos needed a new odometer gear and also was very stiff turning due to the back being pushed in. Maybe it was dropped at one point in its' life, I couldn't tell you.

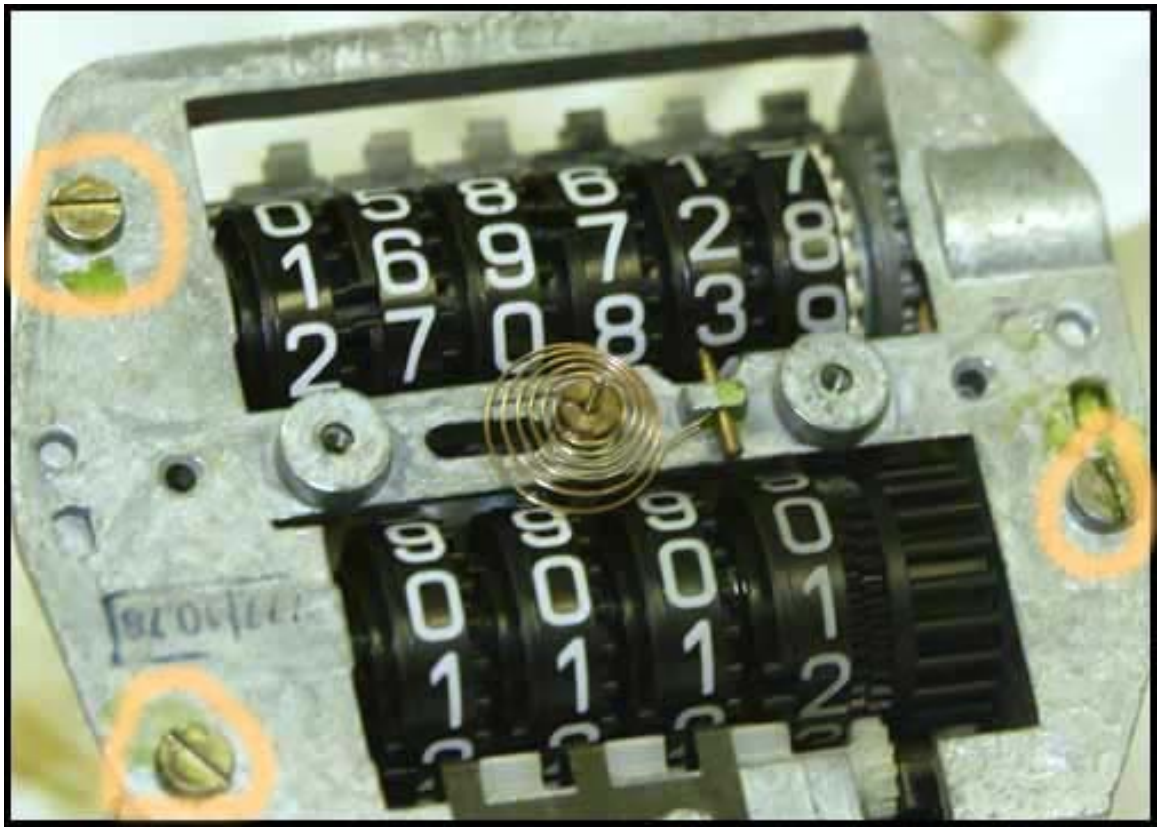
Related links:

Split Odometer Gear Fix
Cluster Removal FAQ
First Fives Website
Axle Ratio/Tire Size Calculator 1.1



First things first. A quick fix for the gear. Simply pop off the broken gear with a screwdriver and press on the new gear. For information on new gears, go to the links above.

Like I said in the disclaimer, I don't take any responsibility if you break your needle. I wanted to show you what is involved in removing the needle. I would suggest using two small screwdrivers and gently prying it up. It's a press fit. Wrap some tape around the ends so you don't scratch the face. Whatever you use, try and get them on the metal, not the plastic. When you get done breaking it, Crazy Glue works to fix it. The one above has this fix. Unscrew the two (2) screws that hold the face on and remove.

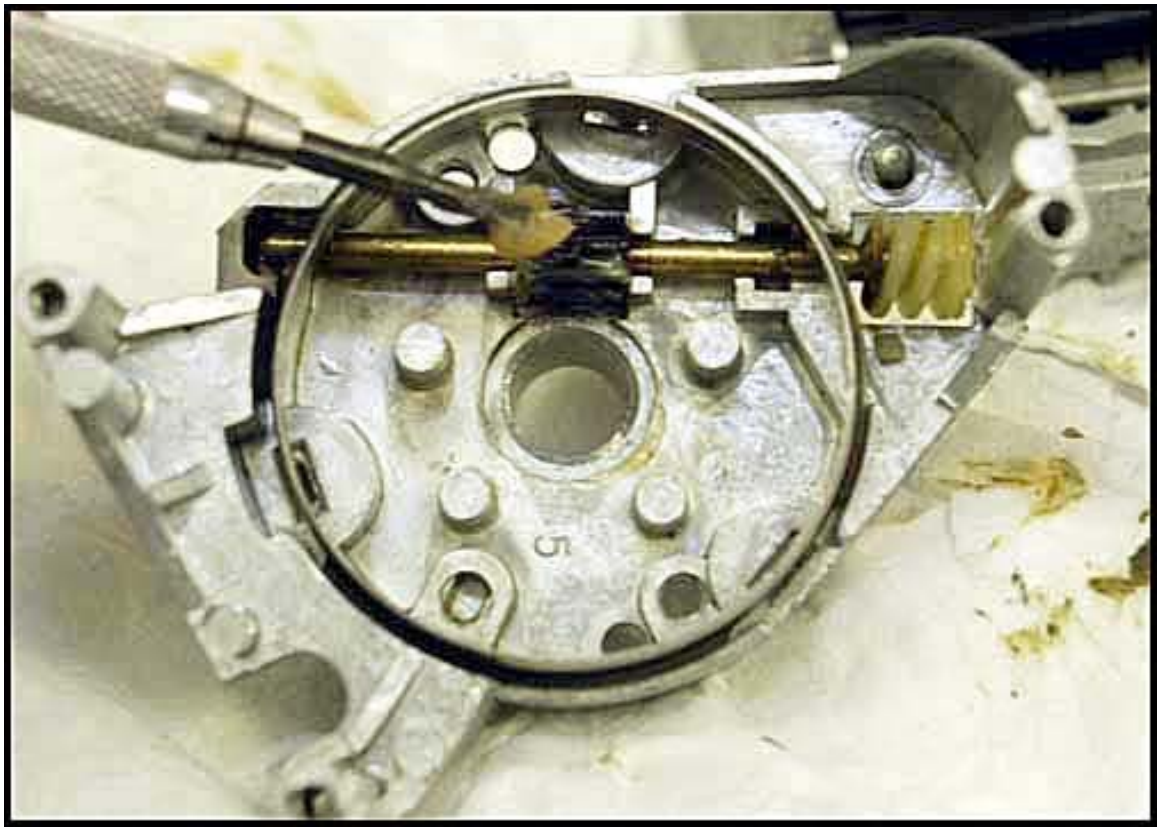


You will see the spring that controls the needle. The speedometer cable drives a gear inside, turning the pin with light friction and two magnetic rings. The faster the cable turns, the more wound up the spring gets. The spring is one of several ways the speedometer is adjusted. Unscrew the three (3) screws from the upper assembly and separate the halves.

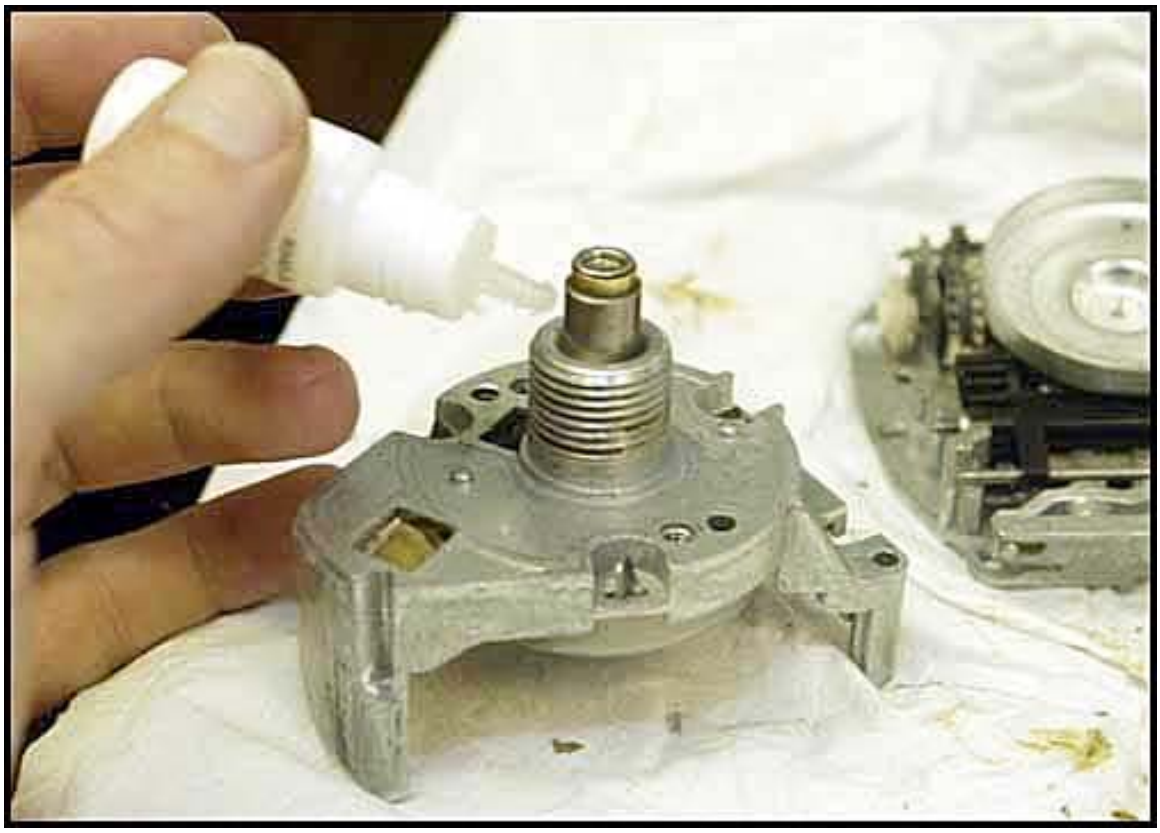
(Left) The pin from the top section fits delicately into the center of the blue section that links to the speedometer cable. As the cable turns the blue "disc", the pin also turns loosely, driving the needle. (Right) This is the bottom of the upper section. The pin is the bottom end of the needle.

My speedometer was very stiff. I figured out the backside was knocked too far in and needed to be pulled back out. I also wanted to inspect the plastic gears while I had it apart. To do this, I knocked the drive gear out. It is held in by glue as far as I could tell.

Using a small screwdriver, I re-applied axel grease to the drive gear, careful not to get it on the shaft.



I washed out all the leftover glue and grease that worked it's way into the housing and re-applied grease to the gears. The ring holds down this shaft. If you want to remove it, use needle nose pliers to untwist the tabs. Otherwise, just use a paper towel and clean off the old grease before you re-apply the new grease.



To reset the drive gear, I used common quickset glue. I carefully applied a few drops to the outside bearing and turned it in the housing until the glue gripped. Make sure you don't get any glue on the drive. The most critical part of this step is to set the drive gear to the correct height. This is why my speedometer was too stiff to begin with.

To figure out the proper position of the drive gear, when you reassemble the two halves, the needle spring should be level. If the center is low or high, the gears might not engage, the drive might be too stiff or the two halves won't fit together.

When putting the two halves back together, put the worm gear in first. Spin the drive a little until you feel the needle engage the drive gear. Put the three (3) screws back in and test spin the drive.

This is the part that I really am guessing about. When putting the needle back on, you need to pre-load the needle and then move it over the stop. The position of the needle in this photo was based on another speedometer that hasn't been taken apart. I would suggest a little trial and error to get the right position or stop by your local garage and get it recalibrated.

I called a speedometer shop in Florida and California and asked about calibrating the speedometer. They said there are about five different things that go into getting it right. In the US, the vehicle is calculated to the speedometer, keeping a standard. On any domestic car, you can generally attach a drill to it, run it up to 1000 rpm and you should get a reading of 60mph. On Euro cars, they adjust the speedometer to the car. According to both these guys, you could have eight different speedometers for one type of car. In other words, watch your speed. There really isn't anyway to calibrate your speedometer if you change it without spending between $300-$400 according to these shops. I am not talking about a rebuild like described above, but actually calibrating it to your car. Even if the speedometers appear to have the same gears, the spring or magnets could all have different rates. A rebuild and gear replacement like I described should run between $85-$150 depending on where you go. Also, don't forget the time it takes for them to do it. Following these steps, you can do a rebuild well within 45 minutes.

You should be ready to go. I hope you still have a working speedometer. Don't call me if you don't. I warned you.